

CALIFORNIA DIVISION OF MINES AND GEOLOGY

FAULT EVALUATION REPORT FER-98

June 26, 1980

1. Name of fault.

Berrocal fault, northwest segment.

2. Location of fault.

Santa Clara County in portions of the Castle Rock Ridge, Cupertino, Los Gatos, and Mindego Hill 7.5-minute quadrangles.

3. Reason for evaluation.

Part of 10-year program to evaluate and revise Alquist-Priolo Special Studies Zones (SSZ) around existing active faults.

4. List of references cited.

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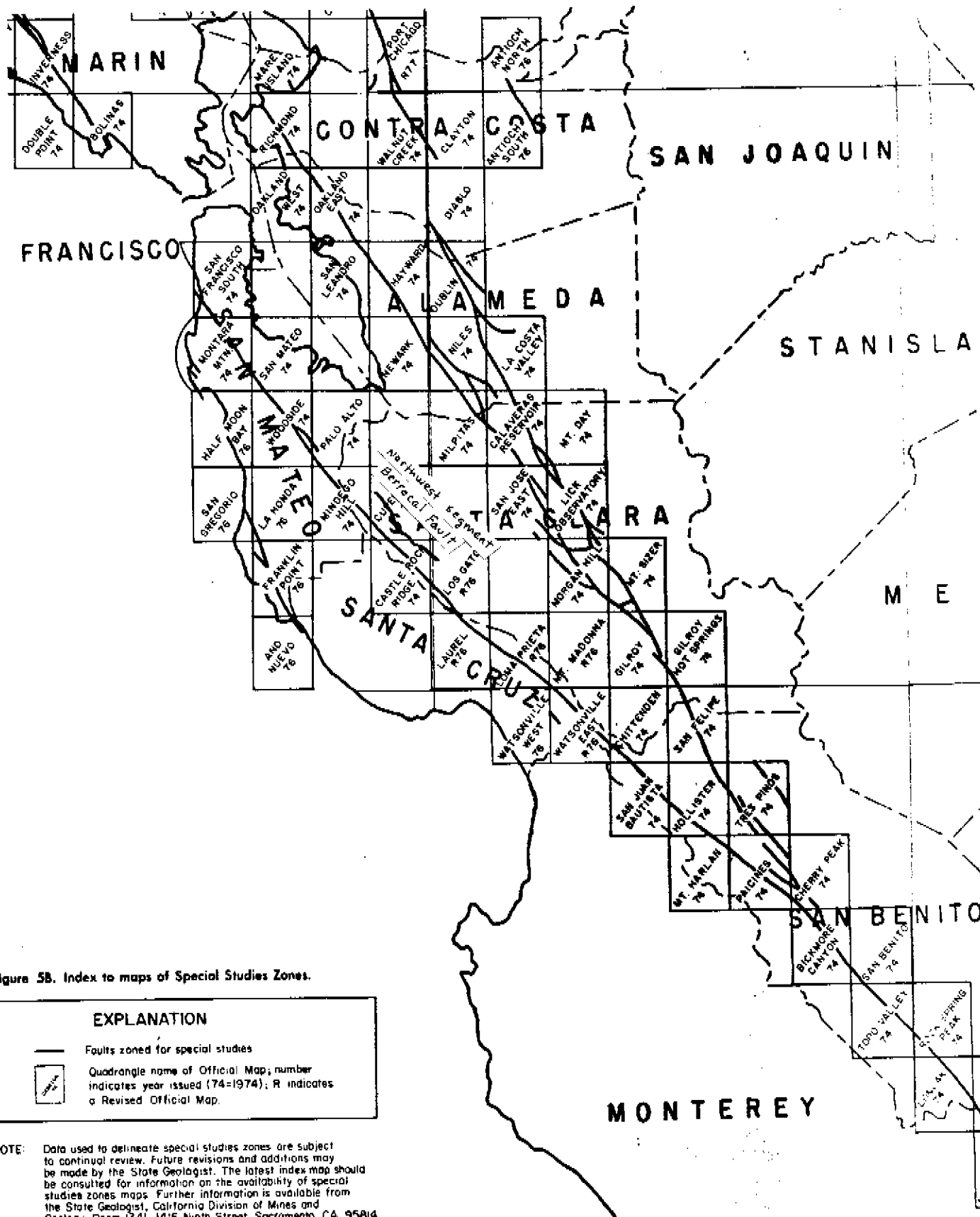
5. Summary of available data.

The northwest segment of the Berrocal fault is located in western Santa Clara County between Los Gatos and Los Altos Hills (Figures 1 and 2). In the vicinity of Los Altos Hills, the northeasternmost branch of the Berrocal fault either intersects or parallels the Monte Vista fault zone (Figure 2). Cotton and Associates (1978; Figure 3 of this report) locate part of the northeast branch of the Berrocal fault west of Los Altos Hills in the vicinity of the Mt. Helen Childrens Home. This trace was previously mapped by Dibblee (1966) and Rogers and Williams (1974) as part of the Shannon/Monte Vista fault and is discussed in FER-95 (Bedrossian, 1980).

According to Sorg and Mc Laughlin (1975), the northwest segment of the Berrocal fault trends northwestward along the eastern base of El Soreno and Monte Bello Ridges and dips steeply to the northeast. The southwest block has been uplifted and has moved laterally to the northwest relative to the northeast block. In general, the fault separates rocks of Jurassic-Cretaceous Franciscan assemblage to the southwest from Miocene and younger rocks to the northeast. Rocks northeast of the Berrocal fault zone include middle Miocene porcellaneous shale, unnamed late Miocene sandstone and shale, late Pliocene and early Pleistocene gravel and sandstone of the Santa Clara Formation,

Figure 1 (FER-98). Index map to the Berrocal fault, Santa Clara County. Base map from Hart (1977, p. 13).

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and older and younger alluvium (Sorg and Mc Laughlin, 1975).

Although late Quaternary activity along the fault is suggested by linear topographic features, ponded water and other geomorphic features (Figures 2 and 5), no conclusive evidence has been found to indicate that strata younger than early Pleistocene are cut by the Berrocal fault (Sorg and Mc Laughlin, 1975; Hay and others, in press). Numerous trenches dug along the fault by various consultants (see Figure 2) revealed faulting in Franciscan (Mesozoic) and Santa Clara (Pleistocene) bedrock, but Holocene topsoil and colluvium were not cut by the fault. Southeast of Saratoga, the fault zone is covered by deeply dissected fanglomerate deposits that probably formed and were deformed in response to the rapid uplift of El Soreno Ridge during middle and late Pleistocene time (Sorg and Mc Laughlin, 1975).

Various interpretations of the location of the Berrocal fault are shown on Figure 2. Fault traces of Rogers (1972), Rogers and Armstrong (1973), and Rogers and Williams (1974) were plotted as mapped on geologic base maps different from Sorg and Mc Laughlin (1975). Therefore, dashed lines across landslides and Quaternary alluvium should, in fact, be dotted indicating a concealed trace in these areas.

According to Mc Laughlin (1974), possible recent activity along the Berrocal fault is suggested by an earthquake that occurred in the Stevens Creek area on April 28, 1967. The earthquake had a hypocentral depth of 7 kilometers and a magnitude 2.8; fault plane solutions for the earthquake suggest either down-to-the-southwest movement across a near-vertical fault or low-angle thrusting from the south (Mc Laughlin, 1974). More recent earthquakes with magnitudes of 3.7 and less have occurred in the vicinity of Stevens Creek, but no ground rupture has been reported

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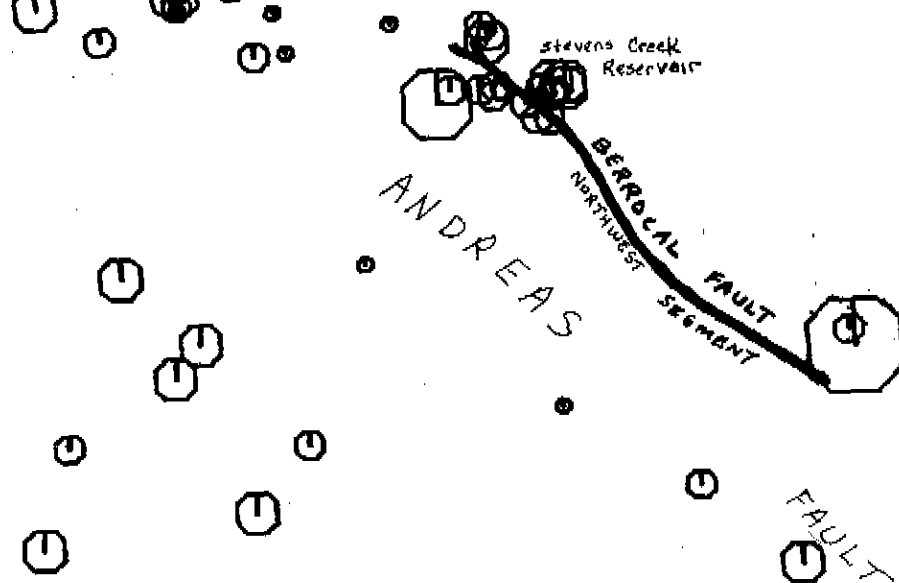
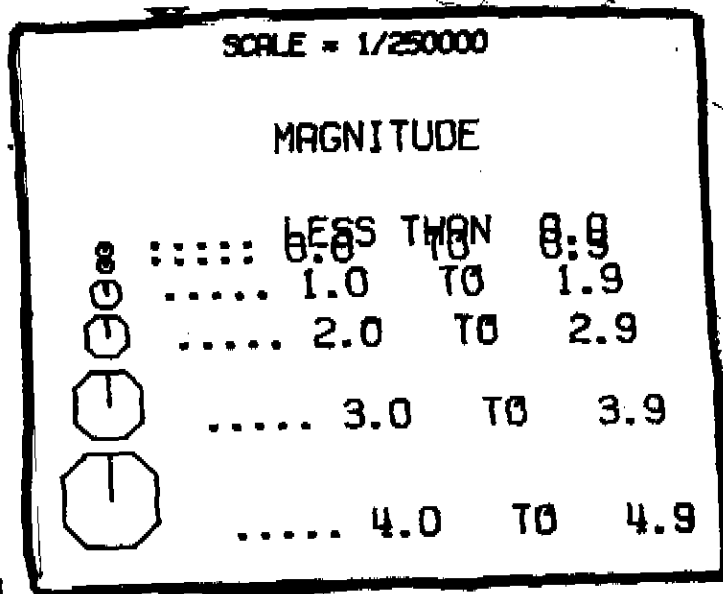


Figure 4 (FER-98). Epicenter data for the Saratoga area. Map from Real and others (1978). Location of the Berrocal fault plotted by J. Moreno, based on Jennings and Burnett (1961), Rogers (1966), and Sorg and Mc Laughlin (1975).

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122.000

as a result of the quakes. "A" quality epicenter data for magnitude 0 to 4.9 earthquakes, plotted by Real and others (1978), is presented in Figure 4. To date, it has not yet been precisely determined whether epicenters reported by McLaughlin (1974) and Real and others (1978) can be specifically related to movement along the Berrocal or other faults.

6. Aerial photo interpretations and field observations.

Analysis of 1939 (National Archives Collection) aerial photographs and field investigations are summarized on Figure 5. Although topographic and tonal lineaments in the hills between Saratoga and Permanente Creek suggest the presence of bedrock faulting in these areas, the faults do not appear to displace colluvial or Holocene alluvial deposits in nearby valleys. No evidence of Holocene displacement was observed along the Berrocal fault near Saratoga Creek, Stevens Creek, or Permanente Creek.

7. Conclusion.

- A. Although late Quaternary activity along the Berrocal fault is suggested by linear topographic and other geomorphic features, there is no conclusive evidence from a review of available data, aerial photo interpretations, or field observations to indicate that strata younger than early Pleistocene are cut by the fault.
- B. Seismic data showing a cluster of epicenters in the vicinity of Stevens Creek Reservoir suggests possible fault movement at depth, but at the surface there has been no reports of Holocene displacement associated with the Berrocal fault. In fact, it has not yet been precisely determined whether the epicenters can be correlated

with movement along mapped traces of the Berrocal or related faults.

- C. Because there is no ^{surface} evidence of Holocene displacement along the northwest branch of the Berrocal fault, the fault does not meet present criteria of being "sufficiently active" for zoning under the Alquist-Priolo Act (Hart, 1977, p. 7).

8. Recommendations.

- A. Because there is no evidence of Holocene displacement along the northwest trace of the Berrocal fault, the fault should not be zoned at this time.
- B. Because there is some suggestion of late Quaternary displacement and epicentral data for recent earthquake activity in the vicinity of Stevens Creek Reservoir:
- (1) additional research and exploration on the Berrocal fault should continue;
 - (2) new information regarding the location and activity of the fault should be evaluated for possible zoning in the future.

9. Report completed on June 25, 1980, by:

Trinda L. Bedrossian

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*I concur with recommendation
not to zone based on evidence
to date. Personnel are not available
for further studies at this time,
but work of other may cause
us to re-evaluate the Berrocal
fault at a later date.
EJH
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